

# LEPTIN AND CYTOKINES ARE NOT THE BEST MARKERS FOR METABOLIC SYNDROME

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## Introduction

- Leptin , some cytokines and triglycéride/cholesterol -HDL ratio (TG/C-HDL ratio) are markers of insulin-resistance in children and adolescents with overweight/obesity. Due to the high prevalence of this pathology it's necessary to find an easy and better routinely marker that identify these patients in the outpatient clinic.
- Previous results demonstrated that the TG/C-HDL ratio > 2 was a better predictor of metabolic syndrome ( sensitivity 100%; specificity 76.7 % ) than HOMA or insulin, without differences between sex and pubertal stage (p<0,0001).

## Objective

- Define if leptin and some cytokines are better markers of insulin-resistance than TG/C-HDL ratio in the pediatric population with overweight/obesity

## Methods

- Patients with overweight/ obesity defined by Orbegozo 2008 were included. Anthropometric variables (body mass index, waist circumference) were measured with standard methods. Sexual maturity was evaluated by Tanner staging.
- Abdominal ultrasound scan was performed to detect liver steatosis.
- Biochemical data :fasting plasma glucose (FPG), 2h OGTT glucose, insulin, HOMA, lipid profile, and C-peptide were analyzed . Cut off point was considered >95th percentile of each variable. Metabolic syndrome was diagnosed according to criteria of Diabetes International Federation .
- Leptin, adiponectin and osteocalcin were analyzed by enzymoinmunoanalysis. SPSS.19 was used for statistical analysis.

## Results

- 110 patients (2-17 years of age ) were included, 40% boys and 44,6% pubertal.
- Clinical and biochemical data are represent in Table .

Table 1: Population characteristics	Mean (Standard Deviations )	Range
Age ( year old )	10,01 ( 3,01)	2,01 - 17
Body Mass Index ( Kg/m2)	27,77 ( 4,11)	19,4 - 36,98
Standard Deviations BMI	4,40 ( 1,53 )	2 - 8,17
Waist Circumference ( cm )	85,61 ( 11,08 )	60,0 - 113,0
TG/C-HDL	2,07 ( 1,9 )	0,28 - 13,03

- There is a positive correlation between TG/C-HDL ratio and
  - ❖ HOMA  $r = 0,358$   $p 0.01$
  - ❖ Leptin  $r = 0,301$   $p 0.04$
  - ❖ Osteocalcin  $r = 0,287$   $p 0.06$
- There is a negative correlation between TG/C-HDL ratio and
  - ❖ Adiponectin  $r = - 0,272$   $p 0.09$ .

- Those patients ( 35 ) with TG/C-HDL ratio >2 have higher levels of leptin (  $p 0,02$  )
  - Leptin nor cytokines levels were not correlated with liver steatosis but interestingly patients with this liver disease have significant higher values of the TG/C-HDL 3.35 vs TG/C-HDL 1.5 (  $p 0,027$  ).

## Conclusions

- Due to differences in standard values of leptin and cytokines related to age, sex and pubertal stage, TG/C-HDL ratio>2 could be an effective and simple tool to identify the early stage of potential metabolic syndrome in overweight/obese pediatric population at any age and pubertal stage, avoiding expensive resources.